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10/538,177	10/12/2006	Seiichi Okuda	KUD-005	1744

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3744	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/538,177	OKUDA ET AL.	
	Examiner	Art Unit	
	Filip Zec	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 May 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1, 10 and 12 have been considered but are moot in view of the new ground(s) of rejection.

2. Applicant's arguments, see pages 7-8, filed 5/22/2009, with respect to the rejection(s) of claims 7 and 11 under 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Patents 5,014,521 to Sakai et al. and 6,481,232 to Faqih, respectively. This rejection is being made non-final to afford the applicants the opportunity to respond to the new grounds of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent Publication JP 11-132582 to Satoshi (Satoshi) in view of U.S. Patent 5,014,521 to Sakai et al. (Sakai).

In reference to claim 1, Satoshi discloses an air-refrigerant cooling apparatus comprising a compressor compressing refrigerant air (7); a heat exchanger (9) cooling said refrigerant air discharged from said compressor (see fig 1); an expansion turbine (10) expanding said refrigerant air discharged from said heat exchanger (pg 12, line 10-11); a defroster (ice trap 20,

FIG. 1; per obviousness explanation below) removing moisture from said refrigerant air discharged from said expansion turbine (via collection of frozen particles, pg 17, line 1-3); a cooled chamber (B) supplied with said refrigerant air from said defroster, said refrigerant air discharged from said cooled chamber being supplied to said compressor (see fig. 1); and a cooled chamber bypass pipe allowing said refrigerant air discharged from said defroster to bypass said cooled chamber and to enter a pipe connected to an outlet of said cooled chamber (pg. 10, paragraph 10, line 9-12); and a defrosting bypass pipe branched from a pipe connected to an outlet of said compressor to supply said defroster with said refrigerant air (warm air bypass, for warming defroster, see fig. 1), but does not teach that said defrosting bypass pipe is located from a point upstream of the heat exchanger directly to the defroster and a defroster. Satoshi teaches an ice trap (20, FIG. 1) which removes moisture from said refrigerant air discharged from said expansion turbine (via collection of frozen particles, pg 17, line 1-3). One of ordinary skill in the art would find it obvious to replace an ice trap with a defroster in order to improve the efficiency of the ice removal process. Sakai shows a refrigeration system (FIG. 1) wherein a compressor (10, FIG. 1) delivers hot gas (col 3, lines 15-25) via a hot gas bypass line (P_6, FIG. 1) from a point upstream of the condenser (20, FIG. 1), to the evaporator coil (50a, FIG. 1) in order to deliver defrosting gas directly to the evaporator coil, via the shortest route, thus minimizing the energy losses and possible leakages linked with the refrigerant transfer (through piping).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Satoshi, to include said defrosting bypass pipe from a point upstream of the heat exchanger and connect said pipe directly to the defroster, as taught by Sakai, in order to deliver defrosting gas directly to the evaporator coil, via the shortest

route, thus minimizing the energy losses and possible leakages linked with the refrigerant transfer (through piping) and to replace the ice trap of Satoshi with a defroster in order to improve the efficiency of the ice removal process.

In reference to claim 2, Satoshi and Sakai teach the cooling apparatus as explained in the rejection of claim 1, and Satoshi also discloses a heat exchanger bypass pipe (22, fig. 2) bypassing said heat exchanger to introduce said refrigerant from said compressor to said expansion turbine.

In reference to claim 3, Satoshi and Sakai teach the cooling apparatus as explained in the rejection of claim 1, and Satoshi also discloses a device measuring a pressure in said defroster (pg. 17, paragraph 24, lines 1-5).

In reference to claim 10, Satoshi discloses transport apparatus comprising an air-refrigerant cooling apparatus including a compressor compresses refrigerant air (7); a heat exchanger (9) cooling said refrigerant air discharged from said compressor (see fig. 1); an expansion turbine (10) expanding said refrigerant air discharged from said heat exchanger (pg 12, line 10-11); a defroster (ice trap 20, FIG. 1; per obviousness explanation below) removing moisture from said refrigerant air discharged from said expansion turbine (via collection of frozen particles, pg 17, line 1-3); a cooled chamber (B) supplied with said refrigerant air from said defroster, said refrigerant air discharged from said cooled chamber being supplied to said compressor (see fig. 1); a cooled chamber bypass pipe allowing said refrigerant air discharged from said defroster to bypass said cooled chamber and to enter a pipe connected to an outlet of said cooled chamber (pg. 10, paragraph 10, line 9-12) and a defrosting bypass pipe branched from a pipe connected to an outlet of said compressor to supply said defroster with said

refrigerant air (warm air bypass, for warming defroster, see fig. 1), but does not teach that said defrosting bypass pipe is located from a point upstream of the heat exchanger directly to the defroster and a defroster. Satoshi teaches an ice trap (20, FIG. 1) which removes moisture from said refrigerant air discharged from said expansion turbine (via collection of frozen particles, pg 17, line 1-3). One of ordinary skill in the art would find it obvious to replace an ice trap with a defroster in order to improve the efficiency of the ice removal process. Sakai shows a refrigeration system (FIG. 1) wherein a compressor (10, FIG. 1) delivers hot gas (col 3, lines 15-25) via a hot gas bypass line (P_6, FIG. 1) from a point upstream of the condenser (20, FIG. 1), to the evaporator coil (50a, FIG. 1) in order to deliver defrosting gas directly to the evaporator coil, via the shortest route, thus minimizing the energy losses and possible leakages linked with the refrigerant transfer (through piping).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Satoshi, to include said defrosting bypass pipe from a point upstream of the heat exchanger and connect said pipe directly to the defroster, as taught by Sakai, in order to deliver defrosting gas directly to the evaporator coil, via the shortest route, thus minimizing the energy losses and possible leakages linked with the refrigerant transfer (through piping) and to replace the ice trap of Satoshi with a defroster in order to improve the efficiency of the ice removal process.

In reference to claim 12, Satoshi discloses a method for operating an air- refrigerant cooling apparatus including a compressor compressing refrigerant air (7, pg 9, paragraph 9, line 1-2); a heat exchanger (9) cooling said refrigerant air discharged from said compressor (see fig 1); an expansion turbine (10) expanding said refrigerant air discharged from said heat exchanger

(pg 12, line 10-11); a defroster ((ice trap 20, FIG. 1; per obviousness explanation below) removing moisture from said refrigerant air discharged from said expansion turbine (via collection of frozen particles, pg 17, line 1-3); a cooled chamber (B) supplied with said refrigerant air from said defroster, said refrigerant air discharged from said cooled chamber being supplied to said compressor (see fig. 1); a cooled chamber bypass pipe allowing said refrigerant air discharged from said defroster to bypass said cooled chamber and to enter a pipe connected to an outlet of said cooled chamber (pg. 10, paragraph 10, line 9-12); and a defrosting bypass pipe branched from a pipe connected to an outlet of said compressor to supply said defroster with said refrigerant air (warm air bypass, for warming defroster, see fig. 1), said method comprising placing said air-refrigerant cooling apparatus into selected one of a plurality of operation modes including a cooling operation mode for cooling said cooled chamber (default, pg. 16, paragraph 23, line 2- 5), and a defrosting mode for defrosting said defroster (pg. 18, paragraph 27, line 1-4); in response to said air-refrigerant cooling apparatus being placed into said cooling operation mode, opening valves disposed on an inlet and outlet of said cooled chamber (dampers, 16,17), and closing a valve disposing in said defrosting bypass line (15); and in response to said air-refrigerant cooling apparatus being placed into said defrosting operation mode, closing said valves disposed on said inlet and outlet of said cooled chamber (dampers, 16,17), and opening said valve disposing in said defrosting bypass line (15), with a motor (M) for driving said compressor and said expansion turbine operated at a rotational speed lower than that for said cooling operation mode (capable of) (see fig. 1), but does not teach that said defrosting bypass pipe is located from a point upstream of the heat exchanger directly to the defroster and a defroster. Satoshi teaches an ice trap (20, FIG. 1) which removes moisture from said refrigerant

air discharged from said expansion turbine (via collection of frozen particles, pg 17, line 1-3). One of ordinary skill in the art would find it obvious to replace an ice trap with a defroster in order to improve the efficiency of the ice removal process. Sakai shows a refrigeration system (FIG. 1) wherein a compressor (10, FIG. 1) delivers hot gas (col 3, lines 15-25) via a hot gas bypass line (P_6, FIG. 1) from a point upstream of the condenser (20, FIG. 1), to the evaporator coil (50a, FIG. 1) in order to deliver defrosting gas directly to the evaporator coil, via the shortest route, thus minimizing the energy losses and possible leakages linked with the refrigerant transfer (through piping).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Satoshi, to include said defrosting bypass pipe from a point upstream of the heat exchanger and connect said pipe directly to the defroster, as taught by Sakai, in order to deliver defrosting gas directly to the evaporator coil, via the shortest route, thus minimizing the energy losses and possible leakages linked with the refrigerant transfer (through piping) and to replace the ice trap of Satoshi with a defroster in order to improve the efficiency of the ice removal process.

In reference to claim 13, Satoshi and Sakai teach the cooling apparatus operating method as explained in the rejection of claim 12, and Satoshi also discloses an air-refrigerant cooling apparatus further including a heat exchanger bypass pipe bypassing said heat exchanger to introduce said refrigerant from said compressor to said expansion turbine (22, fig. 2), and said method further comprising opening a valve (23) disposed in said heat exchanger bypass pipe (see fig. 2) when said air-refrigerant cooling apparatus is placed into said defrosting operation mode, but they do not teach closing a valve introducing said refrigerant air discharged from said

compressor into said heat exchanger. The general concept of providing a valve to close off a passage way near a bypass is old and well known in the art, as illustrated by the damper valves in Satoshi, near the cooling room bypass (see fig. 1).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to modify the method of Satoshi and Sakai, and provide a valve at the heat exchanger bypass and close the valve introducing said refrigerant air discharged from said compressor into said heat exchanger, in order to increase the temperature of the flow of air to the defroster.

In reference to claim 14, Satoshi and Sakai teach the cooling apparatus operating method as explained in the rejection of claim 12, and Satoshi also discloses a device measuring a pressure in said defroster, and said method further comprising: switching said air-refrigerant cooling apparatus from said cooling operation mode to said defrosting operation mode in response to said measured pressure (pg. 17, paragraph 24, line 1-5).

5. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi in view of Sakai as applied to claim 1 above, and further in view of U.S. Patent 6,481,232 to Faqih (Faqih).

In reference to claims 4 and 5, Satoshi and Sakai teach the cooling apparatus as explained in the rejection of claim 1, but do not teach a defroster drying mechanism exchanging moisture-including air within said defroster with external air (per claim 4), wherein said defroster drying mechanism includes a fan discharging air within said defroster (per claim 5). Faqih teaches an apparatus for cooling of closed spaces (FIG. 3) which comprises an evaporator (608, FIG. 3) and a fan (607, FIG. 3) which passes the consumed air in contact with the surfaces of the

evaporator, wherein the exhaust air deposits its heat load and condensate its humidity load (col 11, lines 59-62) in order to accelerate the defrosting process and improve the performance of the cooling unit when it is switched to air-cooling mode (col 10, lines 12-15).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Satoshi and Sakai, to include a fan which passes the consumed air in contact with the surfaces of the evaporator, wherein the exhaust air deposits its heat load and condensate its humidity load, as taught by Faqih, in order to accelerate the defrosting process and improve the performance of the cooling unit when it is switched to air-cooling mode.

In reference to claim 6, Satoshi, Sakai and Faqih teach the cooling apparatus as explained in the rejection of claim 4, and Satoshi also discloses said defroster drying mechanism includes: a suction pipe disposed at a position experiencing a relatively low pressure within a pipe system provided for said air-refrigerant cooling apparatus to communicate with the outside of said pipe system (first air circuit, pg. 18, paragraph 26, line 9-11), and a discharge pipe disposed at a position experiencing a relatively high pressure within said pipe system to communicate with the outside of said pipe system (drain, 21).

6. Claims 7-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoshi in view of U.S. Patent 6,481,232 to Faqih (Faqih).

In reference to claims 7 and 8, Satoshi discloses the air-refrigerant cooling apparatus comprising a compressor compressing refrigerant air (7, pg 9, paragraph 9, line 1-2); heat exchanger (9) cooling said refrigerant air discharged from said compressor (see fig. 1); an expansion turbine (10) expanding said refrigerant air discharged from said heat exchanger (pg

12, line 10-11); a defroster (20) removing moisture from said refrigerant air discharged from said expansion turbine (via collection of frozen particles, pg 17, line 1-3); a cooled chamber (B) supplied with said refrigerant air from said defroster, said refrigerant air discharged from said cooled chamber being supplied to said compressor (see fig. 1), but does not teach a defroster drying mechanism exchanging moisture-including air within said defroster with external air (per claim 7), wherein said defroster drying mechanism includes a fan discharging air within said defroster (per claim 8). Faqih teaches an apparatus for cooling of closed spaces (FIG. 3) which comprises an evaporator (608, FIG. 3) and a fan (607, FIG. 3) which passes the consumed air in contact with the surfaces of the evaporator, wherein the exhaust air deposits its heat load and condensate its humidity load (col 11, lines 59-62) in order to accelerate the defrosting process and improve the performance of the cooling unit when it is switched to air-cooling mode (col 10, lines 12-15).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Satoshi, to include a fan which passes the consumed air in contact with the surfaces of the evaporator, wherein the exhaust air deposits its heat load and condensate its humidity load, as taught by Faqih, in order to accelerate the defrosting process and improve the performance of the cooling unit when it is switched to air-cooling mode.

In reference to claim 9, Satoshi and Faqih teach the cooling apparatus as explained in the rejection of claim 7, and Satoshi also discloses said defroster drying mechanism includes a suction pipe disposed at a position experiencing a relatively low pressure within a pipe system provided for said air-refrigerant cooling apparatus to communicate with the outside of said pipe

system (first air circuit, pg. 18, paragraph 26, line 9-11), and a discharge pipe disposed at a position experiencing a relatively high pressure within said pipe system to communicate with the outside of said pipe system (drain, 21).

In reference to claim 11, Satoshi discloses a transport apparatus comprising an air-refrigerant cooling apparatus including: a compressor compresses refrigerant air (7, pg 9, paragraph 9, line 1-2); a heat exchanger (9) cooling said refrigerant air discharged from said compressor (see fig. 1); an expansion turbine (10) expanding said refrigerant air discharged from said heat exchanger (pg 12, line 10-11); a defroster (20) removing moisture from said refrigerant air discharged from said expansion turbine (via collection of frozen particles, pg 17, line 1-3); and a cooled chamber (B) supplied with said refrigerant air from said defroster, said refrigerant air discharged from said cooled chamber being supplied to said compressor (see fig. 1); but does not teach a defroster drying mechanism exchanging moisture-including air within said defroster with external air. Faqih teaches an apparatus for cooling of closed spaces (FIG. 3) which comprises an evaporator (608, FIG. 3) and a fan (607, FIG. 3) which passes the consumed air in contact with the surfaces of the evaporator, wherein the exhaust air deposits its heat load and condensate its humidity load (col 11, lines 59-62) in order to accelerate the defrosting process and improve the performance of the cooling unit when it is switched to air-cooling mode (col 10, lines 12-15).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Satoshi, to include a fan which passes the consumed air in contact with the surfaces of the evaporator, wherein the exhaust air deposits its heat load and condensate its humidity load, as taught by Faqih, in order to accelerate the

defrosting process and improve the performance of the cooling unit when it is switched to air-cooling mode.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,237,837 to Naruse et al. teaches an ice making machine.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Filip Zec whose telephone number is 571-270-5846. The examiner can normally be reached on Monday-Friday, from 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisors, Frantz Jules or Cheryl Tyler can be reached on 571-272-6681 or 571-272-4834, respectively. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/F. Z./
Examiner, Art Unit 3744

/Cheryl J. Tyler/
Supervisory Patent Examiner, Art Unit 3744

9/9/09